

WHAT IS CLAIMED IS:

1. A cleaning composition comprising a dichloroethylene (I) and one or more alkoxy-substituted perfluoro compounds that contain six carbon atoms (HFE6C) of the formula (II)  $R_1-O-R_2$  where  $R_1$  is perfluorobutyl and  $R_2$  is ethyl, or  $R_1$  is perfluoropentyl and  $R_2$  is methyl, or mixtures thereof, and an additive selected from the groups consisting of:

(A) a highly fluorinated compound of the formula  $C_aF_bH_cX_d$  where  $a$  is an integer from 2 to 8,  $b$  is an integer greater than  $a$  but less than  $2a+2$ ,  $d$  is 0, 1, or 2, and  $c$  is less than or equal to  $2a+2-b-d$  and  $X$  is O, N, halogen, or Si, and combinations thereof;

(B) an enhancement agent selected from the group consisting of alcohols, esters, ethers, cyclic ethers, ketones, alkanes, aromatics, amines, siloxanes, terpenes, dibasic esters, glycol ethers, pyrrolidones, low or non-ozone depleting halogenated hydrocarbons, and mixtures thereof; and

(C) mixtures thereof.

2. A composition as defined in Claim 1, comprising effective amounts of said dichloroethylene and HFE6C and said additive to form an azeotrope or azeotrope like composition.

3. A composition as defined in Claim 1, wherein said dichloroethylene is selected from the group consisting of 1,1-dichloroethylene, 1,2-trans-dichloroethylene, 1,2-cis dichloroethylene, and mixtures thereof.

4. A composition as defined in Claim 1, wherein said alkoxy-substituted perfluoro compound that contains six carbons is selected from the group consisting of all isomers of perfluorobutane ethyl ether and all isomers of perfluoropentane methyl ether.

5. A composition as defined in Claim 1, wherein said dichloroethylene is 1,2-trans-dichloroethylene and said alkoxy-substituted perfluoro compound is perfluorobutane ethyl ether.

6. A composition as defined in Claim 1 wherein said dichloroethylene is present in an amount greater than about 50 weight percent of the mixture.

7. A composition as defined in Claim 1 wherein said alkoxy-substituted perfluoro compound is present in an amount less than or equal to about 30 weight percent of the mixture.

8. A composition as defined in Claim 1, wherein said highly fluorinated compound is selected from the group consisting of tetrafluoroethane, pentafluoroethane, perfluoroethane, pentafluoropropane, hexafluoropropane, heptafluoropropane, perfluoropropane, hexafluorobutane, heptafluorobutane, octafluorobutane, nonafluorobutane, perfluorobutane, heptafluoropentane, octafluoropentane, nonafluoropentane, decafluoropentane, undecafluoropentane, perfluoropentane, octafluorohexane, nonafluorohexane,

decafluorohexane, undecafluorohexane, dodecafluorohexane, tridecafluorohexane, perfluorohexane, 3-chloro-1,1,1-trifluoropropane, 1,1,1,3,3,5,5,5-octafluoropentane, 4-trifluoromethyl-1,1,1,2,2,3,3,5,5,5-decafluoropentane, 4-trifluoromethyl-1,1,1,2,2,5,5,5-octafluoropentane, 4-trifluoromethyl-1,1,1,2,2,3,5,5,5-nonafluoropentane, 1,1,1,2,3,4,4,5,5,5-decafluoropentane, 1,1,1,2,2,3,3,4,4,5,6-undecafluorohexane, 1,1,2,2,3,3,4,4-octafluorobutane, 1,1,1,2,2,3,3,4,4-nonafluorobutane-4-methyl ether, 1,1,1,2,2,3,4,4,4-nonafluoroisobutane-3-methyl ether, 1,1,1,2,2,3,3,4,4-nonafluorobutane-4-ethyl ether, 1,1,1,2,2,3,4,4,4-nonafluoroisobutane-3-ethyl ether, 1,1,2,2,3,3,4,5-octafluorocyclopentane, pentafluoroethane, dichloro-trifluoroethane, trichloro-tetrafluoropropane, dichloro-pentafluoropropane, dichloro-tetrafluoropropane, chloro-pentafluoropropane, chloro-tetrafluoropropane, chloro-hexafluoropropane, pentachloro-difluoropropane, tetrachloro-trifluoropropane, trichloro-trifluoropropane, pentafluoropropane, nonafluorobutylethylene (PFBET) and mixtures thereof.

9. A composition as defined in Claim 1 wherein the highly fluorinated compound is perfluorobutane methyl ether, decafluoropentane or mixtures thereof.

10. A composition as defined in Claim 1 wherein said enhancement agent is selected from the group consisting of methyl alcohol, ethyl alcohol, n-propyl alcohol, isopropyl alcohol, n-butyl alcohol, 2-butyl alcohol, t-butyl alcohol,

1-pentanol, 2-pentanol, 3-pentanol, trifluoroethanol, allyl alcohol, 1-hexanol, 2-hexanol, 3-hexanol, 2-ethyl hexanol, 1-octanol, 1-decanol, 1-dodecanol, cyclohexanol, cyclopentanol, benzyl alcohol, furfuryl alcohol, tetrahydrofurfuryl alcohol, bis-hydroxymethyl tetrahydrofuran, ethylene glycol, propylene glycol, butylene glycol, methyl formate, methyl acetate, methyl propionate, methyl butyrate, ethyl formate, ethyl acetate, ethyl propionate, ethyl butyrate, propyl formate, propyl acetate, propyl propionate, propyl butyrate, butyl formate, butyl acetate, butyl propionate, butyl butyrate, methyl soyate, isopropyl myristate, propyl myristate, butyl myristate, ethyl ether, methyl ether, propyl ether, isopropyl ether, butyl ether, methyl t-butyl ether, ethyl t-butyl ether, vinyl ether, allyl ether, methylal, ethylal, anisole, 1,4 dioxane, 1,3 dioxolane, tetrahydrofuran, methyl THF, dimethyl THF, tetrahydropyran, methyl THP, dimethyl THP, ethylene oxide, propylene oxide, butylene oxide, amyl oxide, isoamyl oxide, acetone, methyl ethyl ketone, 2-pentanone, 3-pentanone, 2-hexanone, 3-hexanone, methyl isobutyl ketone, ethane, propane, butane, methyl propane, pentane, isopentane, methyl butane, cyclopentane, hexane, cyclohexane, dimethylcyclohexane, ethylcyclohexane, isohexane, heptane, methyl pentane, dimethyl butane, octane, nonane, decane, d-limonene, pinene, terpinol, turpentine, dipentene, benzene, toluene, xylene, ethylbenzene, cumene, mesitylene, hemimellitine, pseudocumene, butylbenzene, phenol benzotrifluoride, methylamine, dimethylamine, trimethylamine, ethylamine, diethylamine, triethylamine, n-propylamine, di-n-propylamine, tri-n-propylamine, isopropylamine, di-

isopropylamine, tri-isopropylamine, n-butylamine, isobutylamine, sec-butylamine, tert-butylamine, ethanolamine, diethanolamine, triethanolamine, amino methyl propanol, hydroxylamine hexamethyl disiloxane, octamethyl trisiloxane, decamethyl tetrasiloxane, dimethyl oxalate, dimethyl malonate, dimethyl succinate, dimethyl glutarate, dimethyl adipate, methyl ethyl succinate, methyl ethyl adipate, diethyl succinate, diethyl adipate, ethylene glycol methyl ether, diethylene glycol methyl ether, ethylene glycol ethyl ether, diethylene glycol ethyl ether, ethylene glycol propyl ether, diethylene glycol propyl ether, ethylene glycol butyl ether, diethylene glycol butyl ether, methyl methoxybutanol, propylene glycol methyl ether, dipropylene glycol, dipropylene glycol methyl ether, propylene glycol propyl ether, dipropylene glycol propyl ether, propylene glycol butyl ether, dipropylene glycol butyl ether, pyrrolidone, N-methyl pyrrolidone, N-ethyl pyrrolidone, N-propyl pyrrolidone, N-hydroxymethyl pyrrolidone, N-hydroxyethyl pyrrolidone, N-hexyl pyrrolidone, methyl chloride, methylene chloride, ethyl chloride, dichloro ethane, dichloro ethylene, propyl chloride, isopropyl chloride, propyl dichloride, butyl chloride, isobutyl chloride, sec-butyl chloride, t-butyl chloride, pentyl chloride, hexyl chloride, n-propyl bromide, and mixtures thereof.

11. A composition as defined in Claim 1, further comprising a surfactant.

12. A composition as defined in Claim 1, further comprising a perfume.

13. A composition as defined in Claim 1, further comprising a corrosion inhibitor.

14. A composition as defined in Claim 13, wherein said corrosion inhibitor is selected from the group consisting of alkanols having 4 to 7 carbon atoms, nitroalkanes having 1 to 3 carbon atoms, 1,2-epoxyalkanes having 2 to 7 carbon atoms, acetylene alcohols having 3 to 9 carbon atoms, phosphite esters having 12 to 30 carbon atoms, ethers having 3 to 6 carbon atoms, unsaturated hydrocarbon compounds having 4 to 7 carbon atoms, triazoles, acetals having 4 to 7 carbon atoms, ketones having 3 to 5 carbon atoms, amines having 6 to 8 carbon atoms, and mixtures thereof.

15. An azeotropic or azeotrope-like composition as defined in Claim 1, comprising a member of the group consisting of:

- a) about 50-80 weight percent 1,2-trans dichloroethylene, about 10-30 weight percent nonafluorobutane ethyl ether, and about 0.1-10 weight percent methanol, that boils at about 41°C at approximately 1 atmosphere pressure;
- b) about 50-80 weight percent 1,2-trans dichloroethylene, about 10-30 weight percent nonafluorobutane ethyl ether, and about 0.1-7 weight

- percent ethanol, that boils at about 47°C at approximately 1 atmosphere pressure;
- c) about 50-80 weight percent 1,2-trans dichloroethylene, about 10-30 weight percent nonafluorobutane ethyl ether, and about 0.1-5 weight percent 1-propanol, that boils at about 47°C at approximately 1 atmosphere pressure;
- d) about 50-80 weight percent 1,2-trans dichloroethylene, about 10-30 weight percent nonafluorobutane ethyl ether, and about 0.1-5 weight percent 2-propanol, that boils at about 47°C at approximately 1 atmosphere pressure;
- e) about 50-80 weight percent 1,2-trans dichloroethylene, about 10-30 weight percent nonafluorobutane ethyl ether, and about 0.1-2.5 weight percent t-butanol, that boils at about 47°C at approximately 1 atmosphere pressure;
- f) about 50-80 weight percent 1,2-trans dichloroethylene, about 10-30 weight percent nonafluorobutane ethyl ether, and about 0.1-5 weight percent methylal that boils at about 47°C at approximately 1 atmosphere pressure;
- g) about 50-80 weight percent 1,2-trans dichloroethylene, about 10-30 weight percent nonafluorobutane ethyl ether, and about 0.1-2.5 weight percent methyl acetate, that boils at about 47°C at approximately 1 atmosphere pressure;
- h) about 50-80 weight percent 1,2-trans dichloroethylene, about 10-30 weight percent

nonafluorobutane ethyl ether, and about 0.1-7 weight percent acetone, that boils at about 47°C at approximately 1 atmosphere pressure; and

- i) about 30-80 weight percent 1,2-trans dichloroethylene, about 10-30 weight percent nonafluorobutane ethyl ether, and about 0.1-40 weight percent methylene chloride, that boils at about 47°C at approximately 1 atmosphere pressure.

16. An azeotropic or azeotrope-like composition as defined in Claim 13, comprising a member of the group consisting of:

- a) about 66 weight percent 1,2-trans dichloroethylene, about 26.5 weight percent nonafluorobutane ethyl ether, and about 7.5 weight percent methanol;
- b) about 68.5 weight percent 1,2-trans dichloroethylene, about 27 weight percent nonafluorobutane ethyl ether, and about 4.5 weight percent ethanol;
- c) about 71 weight percent 1,2-trans dichloroethylene, about 28.5 weight percent nonafluorobutane ethyl ether, and about 0.5 weight percent 1-propanol;
- d) about 70.5 weight percent 1,2-trans dichloroethylene, about 27.5 weight percent nonafluorobutane ethyl ether, (and about 2 weight percent 2-propanol (IPA);
- e) about 72 weight percent 1,2-trans dichloroethylene, about 27.5 weight percent nonafluorobutane ethyl ether, and 0.5 weight percent t-butanol;



- f) about 69.5 weight percent 1,2-trans dichloroethylene, about 28 weight percent nonafluorobutane ethyl ether, and about 2.5 weight percent methylal;
- g) about 72 weight percent 1,2-trans dichloroethylene, about 27.5 weight percent nonafluorobutane ethyl ether, and about 0.5 weight percent methyl acetate;
- h) about 72 weight percent 1,2-trans dichloroethylene, about 26 weight percent nonafluorobutane ethyl ether, and about 0.1-7 weight percent acetone; and
- i) about 52 weight percent 1,2-trans dichloroethylene, about 23.5 weight percent nonafluorobutane ethyl ether, and about 24.5 weight percent methylene chloride;

17. An azeotropic or azeotrope-like composition as defined in Claim 1, comprising a member of the group consisting of:

- a) about 50-88 weight percent 1,2-trans dichloroethylene, about 10-30 weight percent nonafluorobutane ethyl ether, about 0.1-10 weight percent methanol, and about 1-25 weight percent 1,1,1,2,3,4,4,5,5,5-decafluoropentane, that boils in a range of about 42 to 47°C at approximately 1 atmosphere pressure;
- b) about 50-88 weight percent 1,2-trans dichloroethylene, about 10-30 weight percent nonafluorobutane ethyl ether, about 0.1-6 weight percent ethanol, and about 1-25 weight percent

- 1,1,1,2,3,4,4,5,5,5-decafluoropentane, that boils in a range of about 47 to 48°C at approximately 1 atmosphere pressure;
- c) about 50-88 weight percent 1,2-trans dichloroethylene, about 10-30 weight percent nonafluorobutane ethyl ether, about 0.1-5 weight percent 2-propanol, and about 1-25 weight percent 1,1,1,2,3,4,4,5,5,5-decafluoropentane, that boils in a range of about 47 to 48°C at approximately 1 atmosphere pressure;
- d) about 50-88 weight percent 1,2-trans dichloroethylene, about 10-30 weight percent nonafluorobutane ethyl ether, about 0.1-8 weight percent acetone, and about 1-25 weight percent 1,1,1,2,3,4,4,5,5,5-decafluoropentane, that boils in a range of about 46 to 48°C at approximately 1 atmosphere pressure;
- e) about 50-88 weight percent 1,2-trans dichloroethylene, about 10-30 weight percent nonafluorobutane ethyl ether, about 0.1-8 weight percent methylal, and about 1-25 weight percent 1,1,1,2,3,4,4,5,5,5-decafluoropentane, (that boils in a range of about 47 to 48°C at approximately 1 atmosphere pressure;
- f) about 50-88 weight percent 1,2-trans dichloroethylene, about 10-30 weight percent nonafluorobutane ethyl ether (HFE-7200), about 0.1-6 weight percent methanol, about 0.1-4 weight percent ethanol, and about 1-25 weight percent

- 1,1,1,2,3,4,4,5,5,5-decafluoropentane, that boils in a range of about 45 to 47°C at approximately 1 atmosphere pressure;
- g) about 50-88 weight percent 1,2-trans dichloroethylene, about 10-30 weight percent nonafluorobutane ethyl ether, about 0.1-6 weight percent methanol, about 0.1-4 weight percent 2-propanol, and about 1-25 weight percent 1,1,1,2,3,4,4,5,5,5-decafluoropentane, that boils in a range of about 45 to 47°C at approximately 1 atmosphere pressure;
- h) about 50-88 weight percent 1,2-trans dichloroethylene, about 10-30 weight percent nonafluorobutane ethyl ether, about 0.1-6 weight percent methanol, about 0.1-4 weight percent methylal, and about 1-25 weight percent 1,1,1,2,3,4,4,5,5,5-decafluoropentane, that boils in a range of about 47 to 48°C at approximately 1 atmosphere pressure;
- i) about 50-88 weight percent 1,2-trans dichloroethylene, about 10-30 weight percent nonafluorobutane ethyl ether, about 0.1-6 weight percent methanol, about 0.1-4 weight percent cyclopentane, and about 1-25 weight percent 1,1,1,2,3,4,4,5,5,5-decafluoropentane, that boils in a range of about 41 to 46°C at approximately 1 atmosphere pressure;
- j) about 50-88 weight percent 1,2-trans dichloroethylene, about 10-30 weight percent

- nonafluorobutane ethyl ether, about 0.1-4 weight percent ethanol, about 0.1-4 weight percent 2-propanol, and about 1-25 weight percent 1,1,1,2,3,4,4,5,5,5-decafluoropentane, that boils in a range of about 47 to 48°C at approximately 1 atmosphere pressure;
- k) about 50-88 weight percent 1,2-trans dichloroethylene, about 10-30 weight percent nonafluorobutane ethyl ether, about 0.1-10 weight percent methanol, and about 1-25 weight percent nonafluorobutane methyl ether that boils in a range of about 41 to 44°C at approximately 1 atmosphere pressure;
- l) about 50-88 weight percent 1,2-trans dichloroethylene, about 10-30 weight percent nonafluorobutane ethyl ether, about 0.1-6 weight percent ethanol, and about 1-25 weight percent nonafluorobutane methyl ether, that boils in a range of about 46 to 48°C at approximately 1 atmosphere pressure;
- m) about 50-88 weight percent 1,2-trans dichloroethylene, about 10-30 weight percent nonafluorobutane ethyl ether, about 0.1-5 weight percent 2-propanol, and about 1-25 weight percent nonafluorobutane methyl ether, that boils in a range of about 47 to 48°C at approximately 1 atmosphere pressure;
- n) about 50-88 weight percent 1,2-trans dichloroethylene, about 10-30 weight percent

nonafluorobutane ethyl ether, about 0.1-10 weight percent acetone, and about 1-25 weight percent nonafluorobutane methyl ether, that boils in a range of about 45 to 47°C at approximately 1 atmosphere pressure;

o) about 50-88 weight percent 1,2-trans dichloroethylene, about 10-30 weight percent nonafluorobutane ethyl ether, about 0.1-8 weight percent methylal, and about 1-25 weight percent nonafluorobutane methyl ether, that boils in a range of about 47 to 48°C at approximately 1 atmosphere pressure;

p) about 50-88 weight percent 1,2-trans dichloroethylene, about 10-30 weight percent nonafluorobutane ethyl ether, about 0.1-6 weight percent methanol, about 0.1-4 weight percent ethanol, and about 1-25 weight percent nonafluorobutane methyl ether, that boils in a range of about 45 to 47°C at approximately 1 atmosphere pressure;

q) about 50-88 weight percent 1,2-trans dichloroethylene, about 10-30 weight percent nonafluorobutane ethyl ether, about 0.1-6 weight percent methanol, about 0.1-4 weight percent 2-propanol, and about 1-25 weight percent nonafluorobutane methyl ether, that boils in a range of about 45 to 47°C at approximately 1 atmosphere pressure;

- r) about 50-88 weight percent 1,2-trans dichloroethylene, about 10-30 weight percent nonafluorobutane ethyl ether, about 0.1-6 weight percent methanol, about 0.1-4 weight percent methylal, and about 1-25 weight percent nonafluorobutane methyl ether, that boils in a range of about 45 to 47°C at approximately 1 atmosphere pressure;
- s) about 50-88 weight percent 1,2-trans dichloroethylene, about 10-30 weight percent nonafluorobutane ethyl ether, about 0.1-6 weight percent methanol, about 0.1-4 weight percent cyclopentane, and about 1-25 weight percent nonafluorobutane methyl ether that boils in a range of about 41 to 43°C at approximately 1 atmosphere pressure; and
- t) about 50-88 weight percent 1,2-trans dichloroethylene, about 10-30 weight percent nonafluorobutane ethyl ether, about 0.1-4 weight percent ethanol, about 0.1-4 weight percent 2-propanol, and about 1-25 weight percent nonafluorobutane methyl ether, that boils in a range of about 47 to 48°C at approximately 1 atmosphere pressure.

18. An azeotropic or azeotrope-like composition as defined in Claim 15, comprising a member of the group consisting of:

- a) about 60-78 weight percent 1,2-trans dichloroethylene, about 10-30 weight percent nonafluorobutane ethyl ether, about 0.1-7 weight percent methanol, and about 1-15 weight percent 1,1,1,2,3,4,4,5,5,5-decafluoropentane;
- b) about 60-78 weight percent 1,2-trans dichloroethylene, about 10-30 weight percent nonafluorobutane ethyl ether, about 0.1-4 weight percent ethanol, and about 1-15 weight percent 1,1,1,2,3,4,4,5,5,5-decafluoropentane;
- c) about 60-78 weight percent 1,2-trans dichloroethylene, about 10-30 weight percent nonafluorobutane ethyl ether, about 0.1-4 weight percent 2-propanol, and about 1-15 weight percent 1,1,1,2,3,4,4,5,5,5-decafluoropentane;
- d) about 60-78 weight percent 1,2-trans dichloroethylene, about 10-30 weight percent nonafluorobutane ethyl ether, about 0.1-4 weight percent acetone, and about 1-15 weight percent 1,1,1,2,3,4,4,5,5,5-decafluoropentane;
- e) about 60-78 weight percent 1,2-trans dichloroethylene, about 10-30 weight percent nonafluorobutane ethyl ether, about 0.1-4 weight percent methylal, and about 1-15 weight percent 1,1,1,2,3,4,4,5,5,5-decafluoropentane;
- f) about 50-78 weight percent 1,2-trans dichloroethylene, about 10-30 weight percent nonafluorobutane ethyl ether, about 0.1-4 weight percent methanol, about 0.1-2 weight percent

- ethanol, and about 1-15 weight percent  
1,1,1,2,3,4,4,5,5,5-decafluoropentane;
- g) about 60-78 weight percent 1,2-trans  
dichloroethylene, about 10-30 weight percent  
nonafluorobutane ethyl ether, about 0.1-4 weight  
percent methanol, about 0.1-2 weight percent 2-  
propanol, and about 1-15 weight percent  
1,1,1,2,3,4,4,5,5,5-decafluoropentane;
- h) about 60-78 weight percent 1,2-trans  
dichloroethylene, about 10-30 weight percent  
nonafluorobutane ethyl ether, about 0.1-4 weight  
percent methanol, about 0.1-3 weight percent  
methylal, and about 1-15 weight percent  
1,1,1,2,3,4,4,5,5,5-decafluoropentane;
- i) about 60-78 weight percent 1,2-trans  
dichloroethylene, about 10-30 weight percent  
nonafluorobutane ethyl ether, about 0.1-4 weight  
percent methanol, about 0.1-2 weight percent  
cyclopentane, and about 1-15 weight percent  
1,1,1,2,3,4,4,5,5,5-decafluoropentane;
- j) about 60-78 weight percent 1,2-trans  
dichloroethylene, about 10-30 weight percent  
nonafluorobutane ethyl ether, about 0.1-4 weight  
percent ethanol, about 0.1-4 weight percent 2-  
propanol, and about 1-15 weight percent  
1,1,1,2,3,4,4,5,5,5-decafluoropentane;
- k) about 60-78 weight percent 1,2-trans  
dichloroethylene, about 10-30 weight percent  
nonafluorobutane ethyl ether, about 0.1-5.5 weight



- percent methanol, and about 1-18 weight percent nonafluorobutane methyl ether;
- l) about 60-78 weight percent 1,2-trans dichloroethylene, about 10-30 weight percent nonafluorobutane ethyl ether, about 0.1-3.5 weight percent ethanol, and about 1-18 weight percent nonafluorobutane methyl ether;
- m) about 60-78 weight percent 1,2-trans dichloroethylene, about 10-30 weight percent nonafluorobutane ethyl ether, about 0.1-4 weight percent 2-propanol, and about 1-18 weight percent nonafluorobutane methyl ether;
- n) about 60-78 weight percent 1,2-trans dichloroethylene, about 10-30 weight percent nonafluorobutane ethyl ether, about 0.1-3 weight percent acetone, and about 1-18 weight percent nonafluorobutane methyl ether;
- o) about 60-78 weight percent 1,2-trans dichloroethylene, about 10-30 weight percent nonafluorobutane ethyl ether, about 0.1-3 weight percent methylal, and about 1-18 weight percent nonafluorobutane methyl ether;
- p) about 60-78 weight percent 1,2-trans dichloroethylene, about 10-30 weight percent nonafluorobutane ethyl ether, about 0.1-3 weight percent methanol, about 0.1-2 weight percent ethanol, and about 1-20 weight percent nonafluorobutane methyl ether;

- q) about 60-78 weight percent 1,2-trans dichloroethylene, about 10-30 weight percent nonafluorobutane ethyl ether, about 0.1-3 weight percent methanol, about 0.1-2 weight percent 2-propanol, and about 1-20 weight percent nonafluorobutane methyl ether;
- r) about 60-78 weight percent 1,2-trans dichloroethylene, about 10-30 weight percent nonafluorobutane ethyl ether, about 0.1-3 weight percent methanol, about 0.1-2 weight percent methylal, and about 1-20 weight percent nonafluorobutane methyl ether;
- s) about 60-78 weight percent 1,2-trans dichloroethylene, about 10-30 weight percent nonafluorobutane ethyl ether, about 0.1-3 weight percent methanol, about 0.1-2 weight percent cyclopentane, and about 1-20 weight percent nonafluorobutane methyl ether; and
- t) about 60-78 weight percent 1,2-trans dichloroethylene, about 10-30 weight percent nonafluorobutane ethyl ether, about 0.1-4 weight percent ethanol, about 0.1-4 weight percent 2-propanol, and about 1-20 weight percent nonafluorobutane methyl ether.'

19. A method of cleaning a solid surface which comprises treating said surface with a composition as defined in Claim 1.

20. The method of Claim 19, wherein the solid surface is a printed circuit board, silicon wafer, electrical component or microelectronic device.

21. The method of Claim 19, wherein the solid surface is an optical device, lens or optical mold.

22. The method of Claim 19, wherein the solid surface is metal, plastic, cloth or glass.

23. The method of Claim 19, wherein the composition is contacted with the surface at a temperature from 32°F. (0°C.) to and including the boiling point of the composition.

24. The method of Claim 19 wherein the solid surface is heated to a temperature above the boiling point of the composition then the solid surface is contacted with the composition.

25. The method of Claim 24 wherein the mixture is contacted with the heated surface as a liquid or an aerosol.

26. The method of Claim 19, where the mixture is contacted with the surface as an aerosol.

27. The method of Claim 19, where the mixture is contacted with the surface as a liquid.

28. The method of Claim 19, where the mixture is contacted with the surface as a vapor.

29. A method of solvating a solid or liquid material by contacting said material with a composition as defined in Claim 1.

30. The method of Claim 29, where the composition is contacted with the material in a temperature range from 32°F. (0°C.) to and including the boiling point of the composition to thereby dissolve the material.

31. The method of Claim 20, wherein the solid surface to be cleaned is contaminated with flux, resin, adhesive, oil, grease, photoresist, polymers, or combinations thereof.

32. The method of Claim 21, wherein the solid surface to be cleaned is contaminated with flux, rosin, ink, wax, dirt, resin, adhesive, buffing compound, oil, grease, polymers, or combinations thereof.

33. The method of Claim 22, wherein the solid surface to be cleaned is contaminated with dirt, flux, rosin, resin, ink, wax, adhesive, paint, latex, oil, polymers, or combinations thereof.